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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/681,853

10/06/2003

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H0004421

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128 7590 08/19/2008
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EXAMINER

GOLDFARB, JONATHAN A

ART UNIT

PAPER NUMBER

3664

MAIL DATE

DELIVERY MODE

08/19/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed 15 January 2008, with respect to 35 USC 102(a), 103(a), and 112 rejections have been fully considered and are persuasive. The rejections of the relevant claims have been withdrawn, based on amendments.
2. Applicant's arguments filed 15 January 2008 have been fully considered but they are not persuasive. Regarding claim 14, applicant argues that the Shultz reference does not disclose either identifying working CMG arrays [Fig. 4 shows that all working arrays require control and feedback], nor determining another array orientation having more favorable control characteristics [Fig. 2B(218, 225); Fig. 4(404) – feedback loop to rotors; 0028-0028]. It follows that dependent claims 15-20 are rejected based on the rejection of claim 14.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 3-13 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 3 rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 14-15, and 19-20 rejected under 35 U.S.C. 102(a) as being anticipated by Shultz (US 2002/0145077). Shultz discloses a method of improving momentum control of a space vehicle by reorienting a CMG array comprising:

- a. Identifying which CMGs are working [Fig. 4 and related text; 0029];
- b. determining another array orientation having more favorable control characteristics [Fig. 2B(218, 225); Fig. 4(404) – feedback loop to rotors; 0028-0029];
- c. releasing one or more locks fixing one or more CMGs in place in the array [Fig. 2B(224); Fig. 4(406, 412, 414, 420); 0028-29];
- d. activating drive means for the one or more released CMGs to produce the another array orientation [Fig. 2B(218, 225); Fig. 4(404); 0027-0029];

e. engaging the one or more locks to once again fix the one or more CMGs in place in the another array orientation [Fig. 2B(224); Fig. 4(406, 412, 414, 420); 0028-0029].

Regarding claim 15, the method of claim 14, wherein determining the best vehicle state for array reorientation, and adjusting CMG momentum for minimum negative vehicle impact during reorientation of the array [0038-0039].

Regarding claim 19, the method of claim 14 wherein the determining step comprises determining more favorable control characteristics after failure of a CMG of the array [0041].

Regarding claim 20, the method of claim 14, wherein the determining step comprises at least in part, retrieving pre-planned array reorientation data from memory [Fig. 3C; 0036].

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Shultz (US 2002/0145077) as applied to claim 14 above, and further in view of Lie et al. (US 6,285,927). Shultz discloses the method of claim 14, above. However Shultz is silent

regarding updating vehicle control parameters for the another array orientation. Lie et al. teaches this element [col. 2, lines 12-24].

Therefore, it would have been obvious to one of ordinary skill in the art to have modified the dynamic CMG array of Shultz to include updating the spacecraft attitude for the purpose of spacecraft control, as taught by Lie et al.

10. Claims 17-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Shultz (US 2002/0145077) as applied to claim 14 above, and further in view of the applicant's admitted prior art [specification 0030].

Regarding claim 17, the method of claim 14 prior to the determining step, first determining whether more favorable vehicle control characteristics can be obtained [Fig. 2B(218, 225); Fig. 4(404) – feedback loop to rotors; 0028-0029] given the then current vehicle mass characteristics and the number of working CMGs [specification 0030].

Regarding claim 18, the method of claim 14 wherein the determining step comprises determining more favorable control characteristics taking into account whether the space vehicle mass characteristics have changed since a prior array orientation was determined [specification 0030].

Therefore, it would have been obvious to one of ordinary skill in the art to take into account Shultz's vehicle mass for favorable controls thereof because it facilitates commonly known favorable vehicle control characteristics, as shown by applicant's admitted prior art.

Allowable Subject Matter

11. Claims 1-2 allowed.
12. Claim 3 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.
13. Claims 4-13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
14. The following is an examiner's statement of reasons for allowance: In particular, the plurality of detents in the rotating base and related locking pin are novel features for a CMG, especially for use in a space vehicle. Prior art only shows CMG arrays (Shultz – US 2002/0145077), launch locks (Bender et al. - US 5,261,631), clutch-caging (Kukel et al. – US 3,452,948), and pin/detent caging (Lewis Jr. et al. – US 3,111,038).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN GOLDFARB whose telephone number is (571)272-7964. The examiner can normally be reached on M-Th 9-5, F ~2.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3664

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JG

01-Aug-08

/KHOI TRAN/

Supervisory Patent Examiner, Art Unit 3664